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(71) Applicant(s)

Karsten Manufacturing Corporation

(Incorporated in USA - Arizona)

2201 W.Desert Cove, Phoenix, Arizona 85029,
United States of America

(72) Inventor(s)

John A. Solheim

(74) Agent and/or Address for Service

Mewburn Ellis

York House, 23 Kingsway, LONDON, WC2B 6HP,
United Kingdom

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A6D D23C

(56) Documents Cited

GB 2215818 A

GB 0236875 A

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(54) Golf club head with visual indicators

(57) A golf club head 10 includes a body 12 with a heel end 16, a toe end 18, and a front face 22 arranged for impact with a golf ball. A plurality of elongated grooves 48, 50 are formed in the front face 22 of the body 12. A pair of visual indicators 52 are provided on the front face 22 and are aligned with one of the grooves 48a. One of the visual indicators 52 is aligned with a heel end of the groove 48a, and the other visual indicator 52 is aligned with a toe end of the groove 48a. When the club head 10 is placed at "address" behind a golf ball, the visual indicators 52 are utilized in a manner to position the club head 10 so that the elongated grooves 48, 50 in the front face 22 lie perpendicular to an intended target line. This prevents the club head 10 from being inadvertently positioned with the front face 22 "open" or "closed".

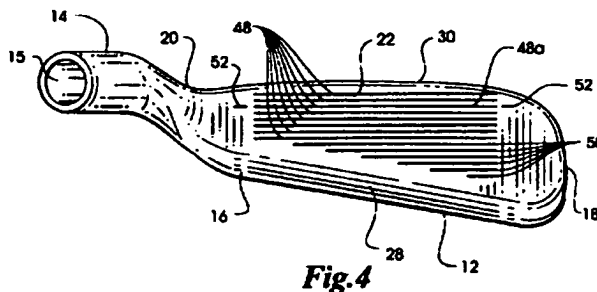


Fig. 4

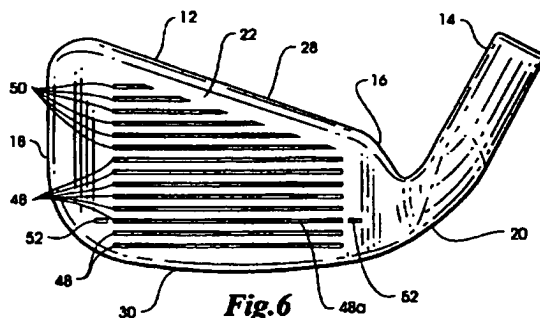
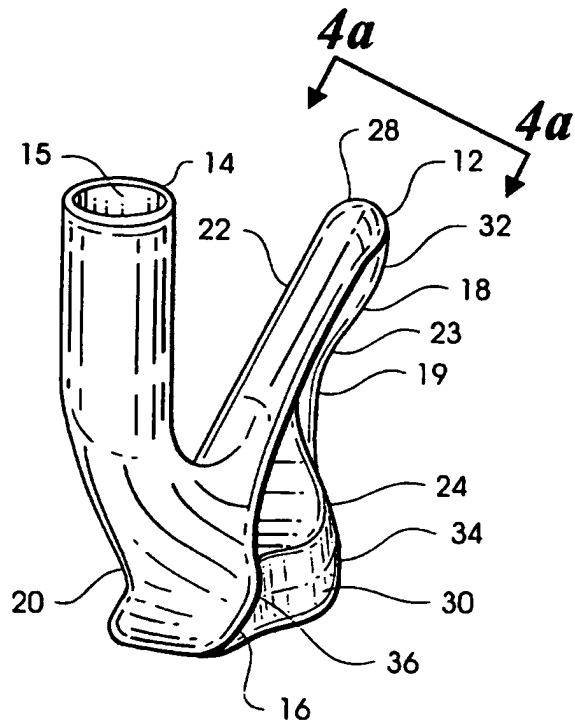
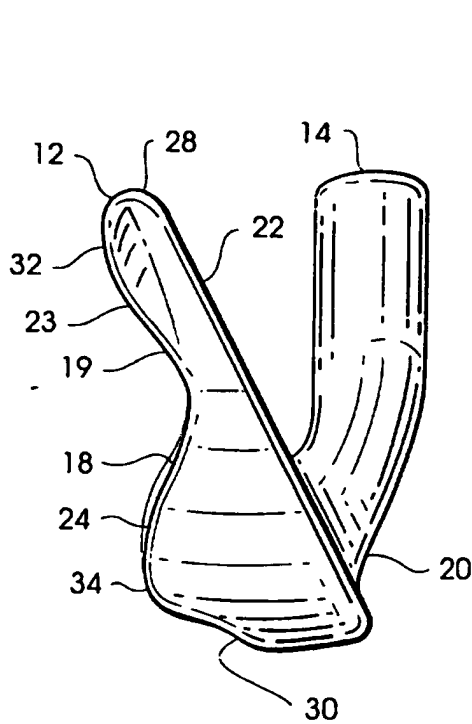
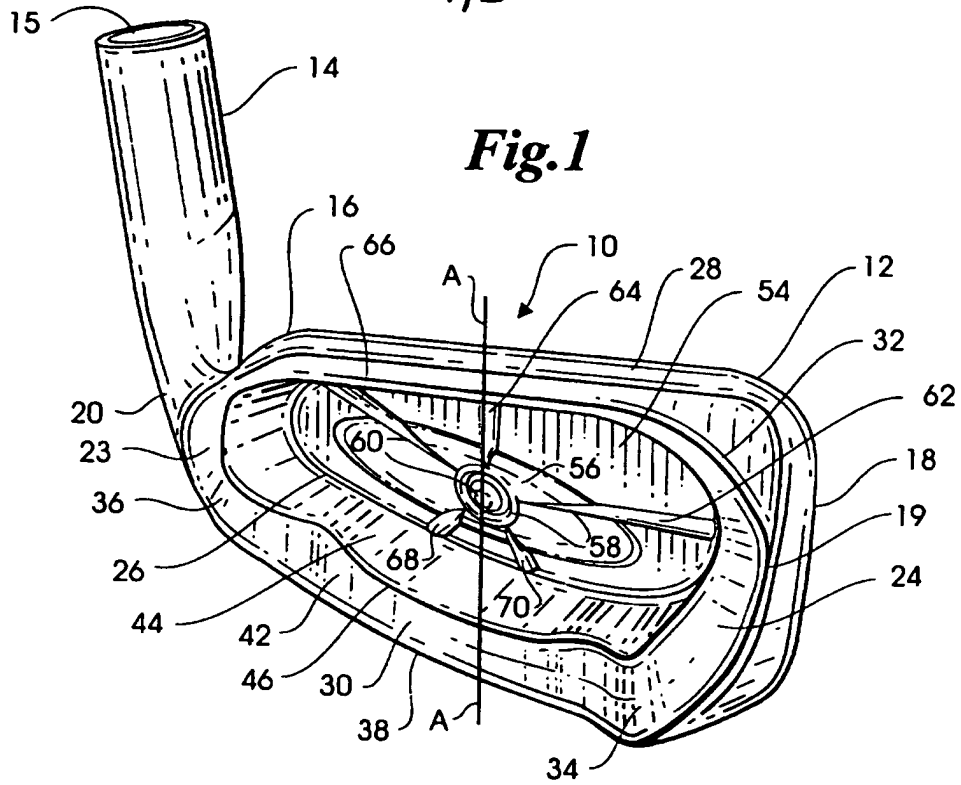


Fig. 6

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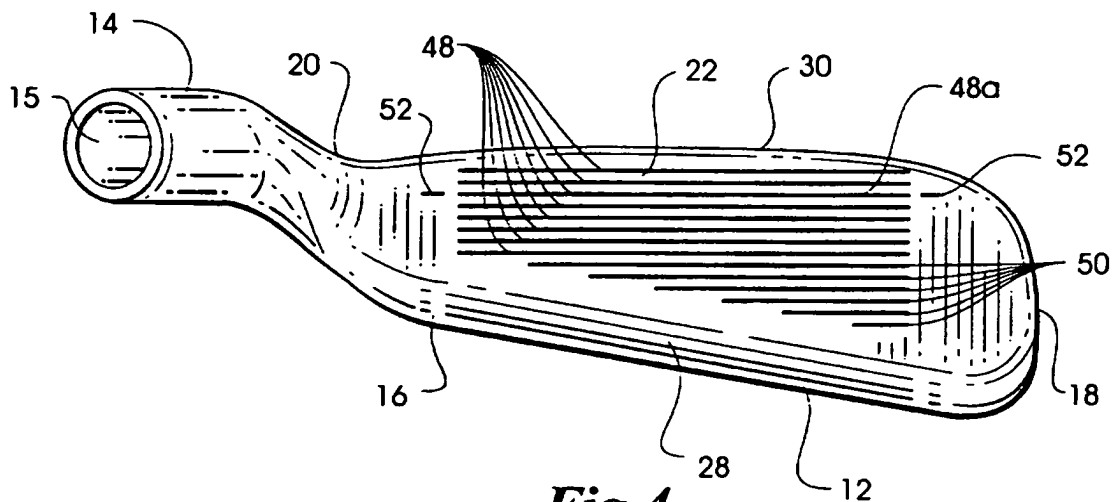


Fig. 4

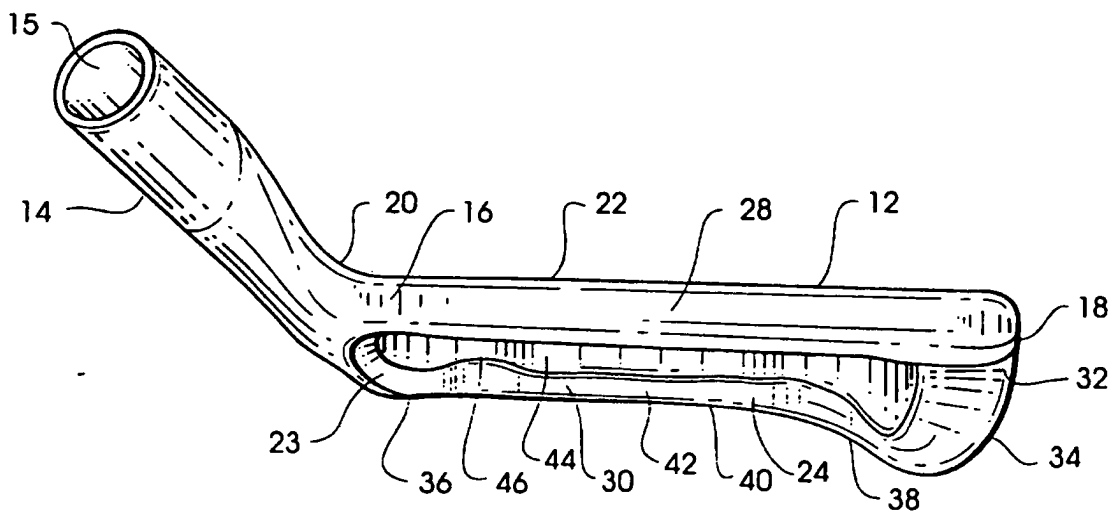
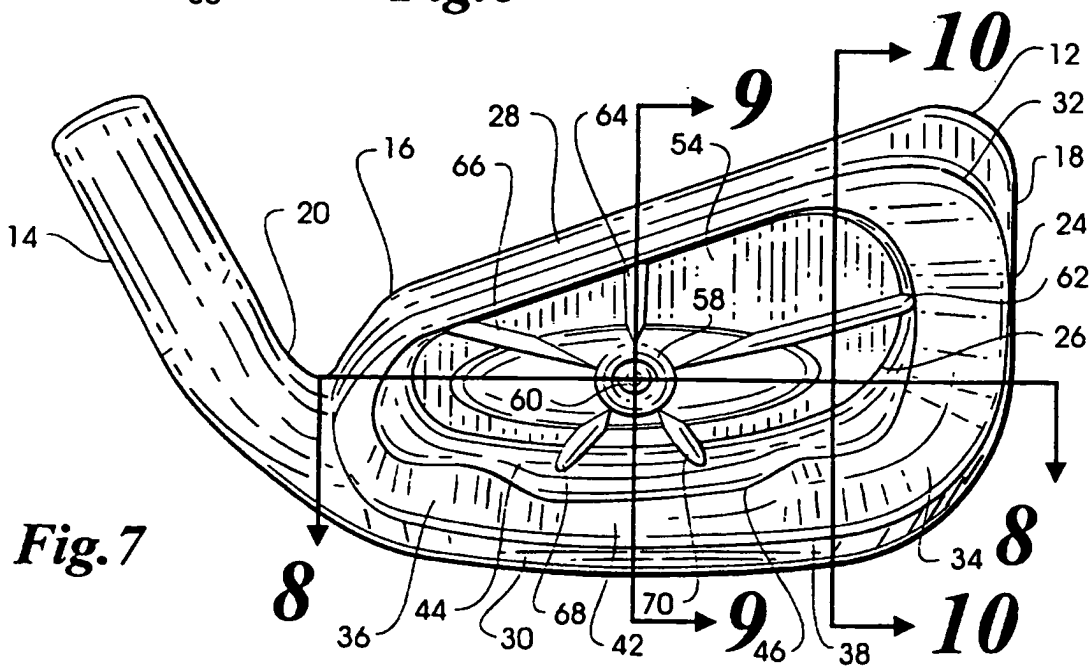
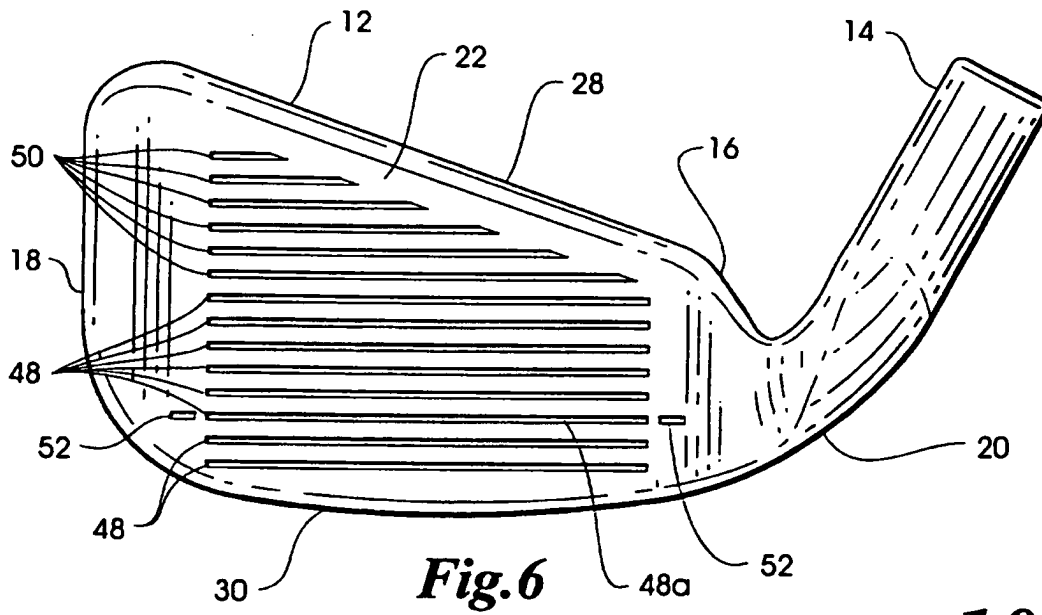
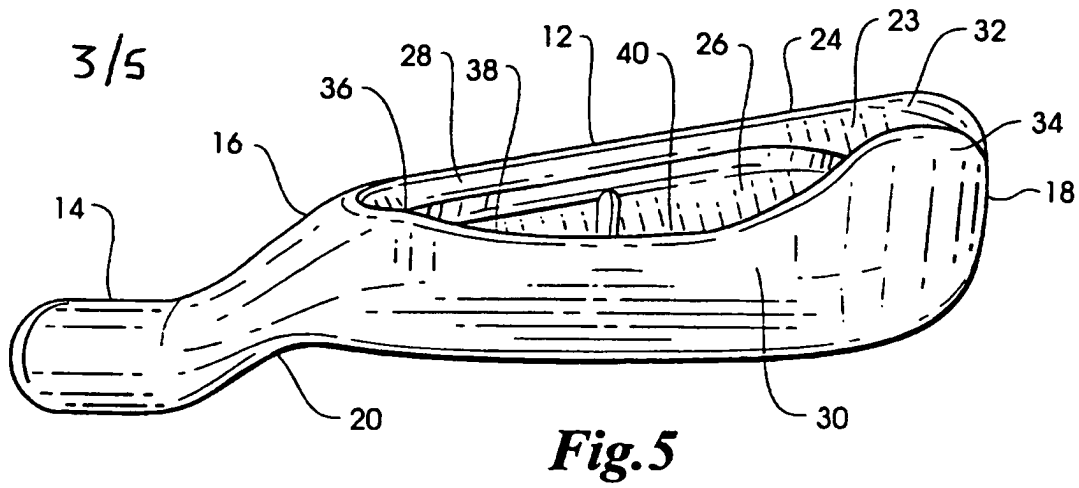


Fig. 4a



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Fig.8

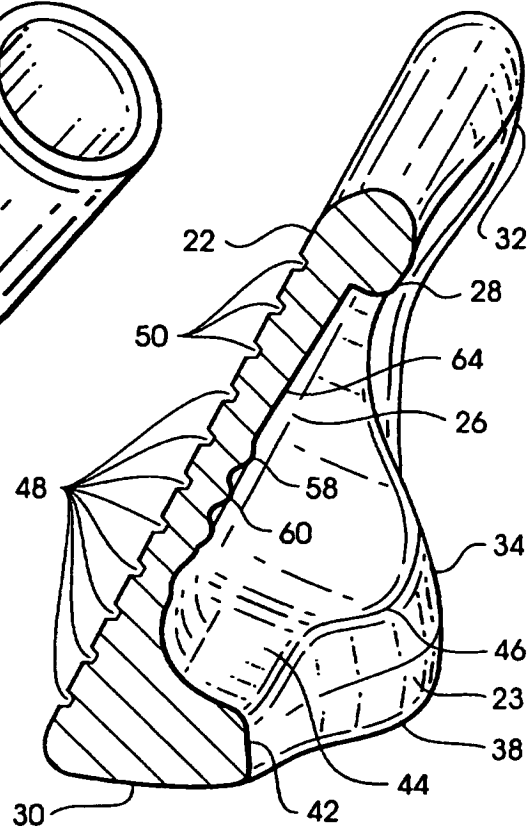
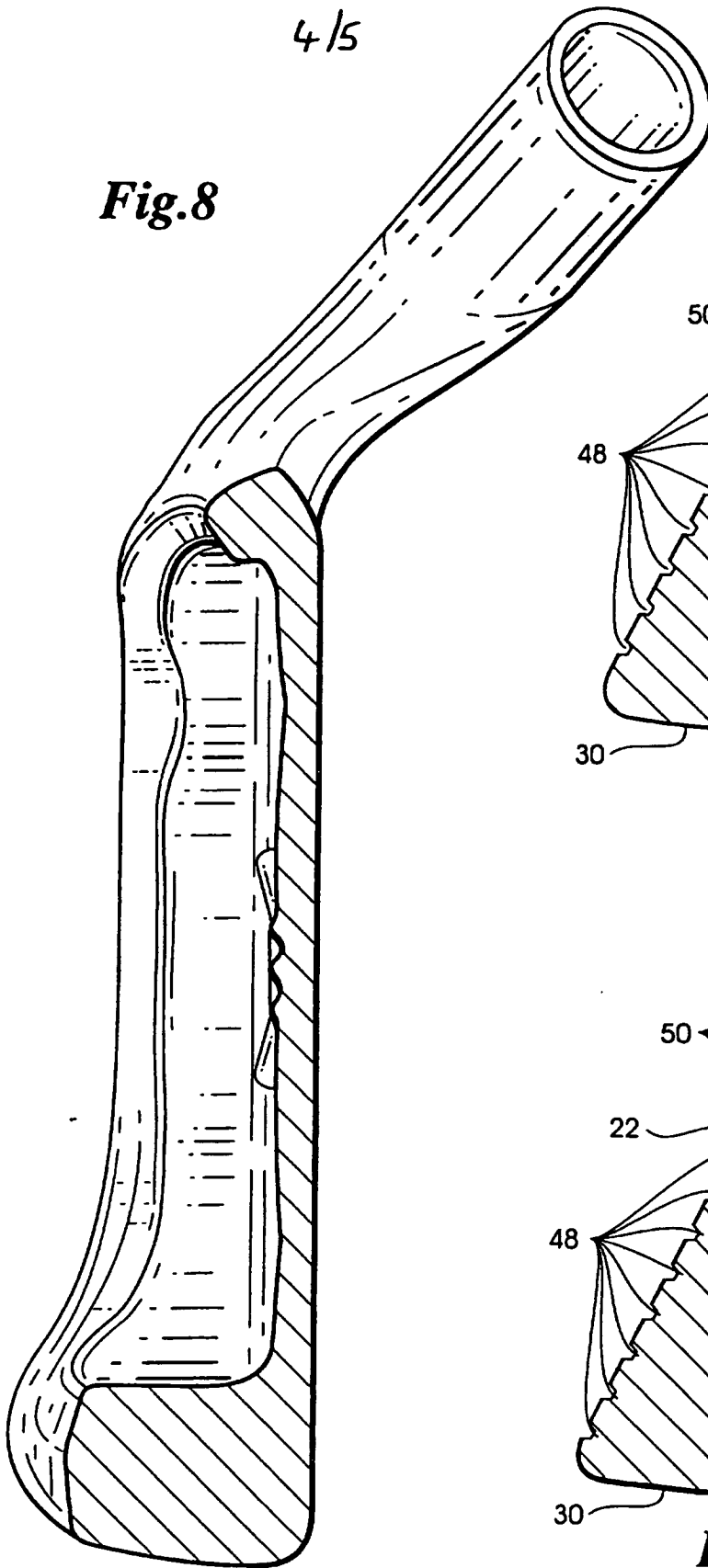


Fig.9

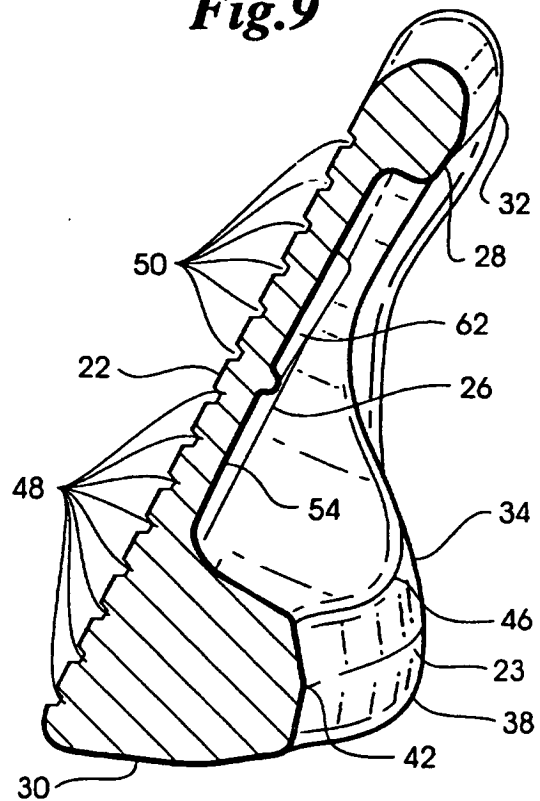


Fig.10

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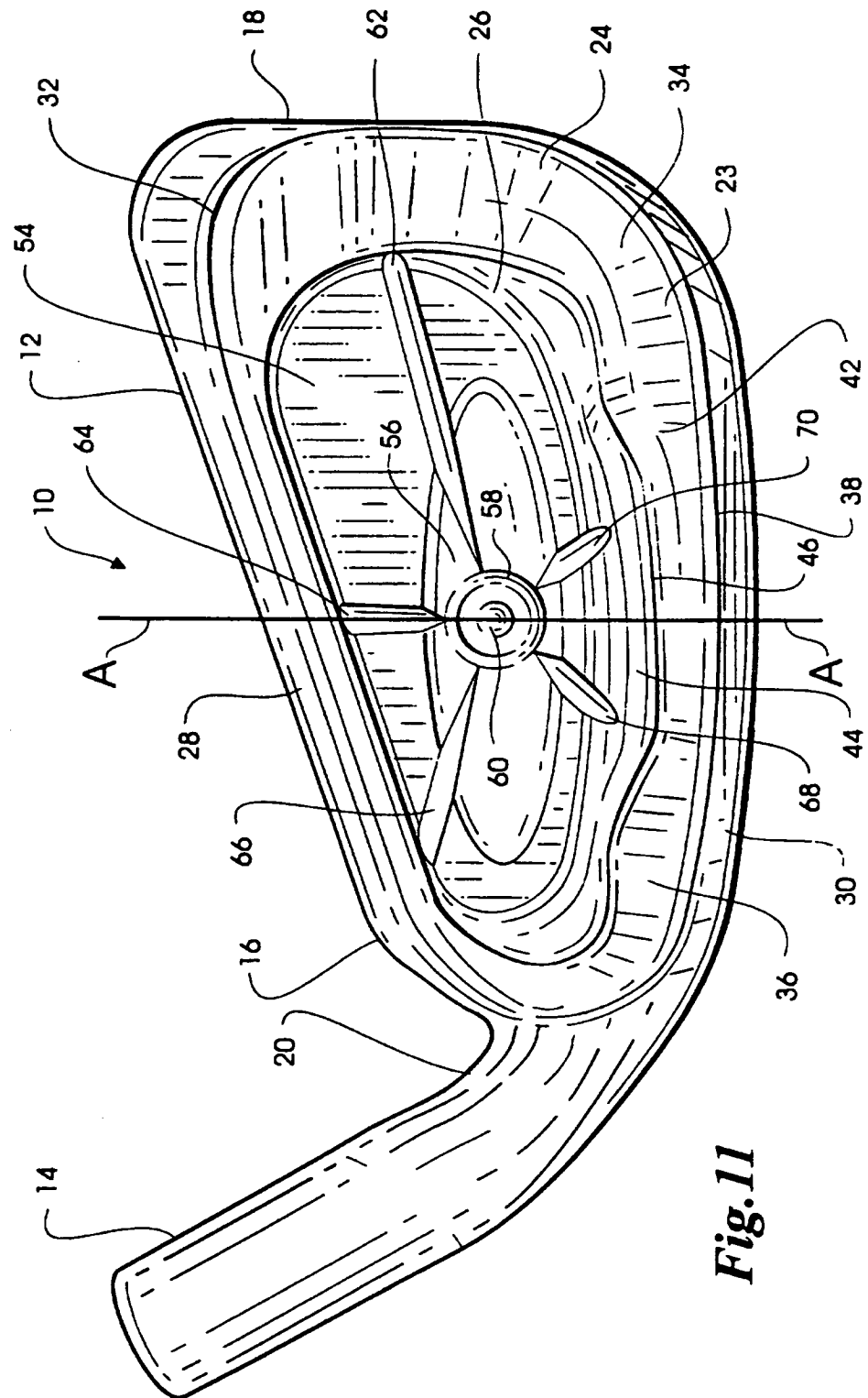


Fig. 11

GOLF CLUB HEAD WITH VISUAL INDICATORS

This invention relates generally to golf equipment and, in particular, to a golf club head with visual indicators.

Golf club heads have typically included a body having a front face which impacts a golf ball. A plurality of elongated grooves are formed on the front face of the body. It has become customary to fill one of these elongated grooves with paint for use as a visual reference for positioning the club head so that the front face lies perpendicular to an intended target line. This visual reference is useful in preventing the club head from being positioned with its front face "open" or "closed". A drawback of this visual reference is that the paint in the groove is quickly covered with dirt or is removed by repeated contact between the front face and a golf ball.

The present invention provides a golf club head comprising a body having a heel end, a toe end, a front face arranged for impact with a golf ball, and a plurality of grooves formed in the front face. The grooves are elongated in a direction extending between the heel and toe ends of the body. A pair of visual indicators are disposed on the front face and are aligned with one of the grooves for positioning the golf club head so that the grooves lie perpendicular to an intended target line. One of the visual

indicators is disposed adjacent a heel end of the one groove, and the other visual indicator is disposed adjacent a toe end of the one groove. When the visual indicators are utilized, the golf club head will not be inadvertently positioned with the front face "open" or "closed".

A preferred embodiment of the present invention will now be described in detail with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of a golf club head according to a preferred embodiment of the present invention;

Fig. 2 is a toe end view of the golf club head of Fig. 1;

Fig. 3 is a heel end view of the golf club head of Fig. 1;

Fig. 4 is a top view of the golf club head of Fig. 1;

Fig. 4a is a view of the golf club head of Fig. 1 taken along lines 4-4 in Fig. 3;

Fig. 5 is a bottom view of the golf club head of Fig. 1;

Fig. 6 is a front elevational view of the golf club head of Fig. 1;

Fig. 7 is a rear elevational view of the golf club head of Fig. 1;

Fig. 8 is an enlarged cross-sectional view taken along lines 8-8 in Fig. 7;

Fig. 9 is an enlarged cross-sectional view taken along lines 9-9 in Fig. 7;

Fig. 10 is an enlarged cross-sectional view taken along lines 10-10 in Fig. 7; and

Fig. 11 is an enlarged rear elevational view of the golf club head of Fig. 1.

Referring to Figs. 1-7, a golf club head 10 according to a preferred embodiment of the present invention includes a body 12 and a hosel 14 with a cylindrical bore 15 for receiving a golf club shaft (not shown). Although the club head 10 is shown as a five-iron, it could be any iron-type club head from a one-iron to a wedge. The body 12 has a heel end 16 and a toe end 18 that are spaced apart. The hosel 14 is adjacent the heel end 16 of the body 12 and includes a neck 20 which has a reduced thickness as described in U.S. Patent No. 4,512,577 to Karsten Solheim. The body 12 and the hosel 14 are preferably cast from suitable metal such as beryllium copper or stainless steel. A front face 22 for arranged for impact with a golf ball (not shown) is provided on the body 12 and extends between the body heel and toe ends 16, 18 along a frontal portion of the body 12. Disposed rearwardly of the front face 22 is a back face 23.

A perimeter weighting element 24 protrudes rearwardly away from the front face 22 and defines a cavity 26 in the back face 23. The perimeter weighting member 24 includes a top rail 28 and a sole 30. The cavity 26 is defined at its upper extremity by the top rail 28 and at its lower extremity by the sole 30. The top rail 28 extends between the body heel and toe ends 16, 18 along an upper portion of the body 12, and the sole 30 extends between the body heel and toe ends 16, 18 along a lower portion of the body 12. The perimeter weighting element 24 also includes an upper toe weight 32 adjacent a toe end of the top rail 28, a lower toe weight 34 adjacent a toe end of the sole 30, and a lower heel weight 36 adjacent a heel end of the sole 30. The toe end 18

of the body 12 has a back edge 19 that is indented toward the front face 22 between the top rail 28 and the sole 30 separating the upper toe weight 32 from the lower toe weight 34.

The upper and lower toe weights 32, 34 and the lower heel weight 36 provide the club head 10 with resistance to twisting movement about a vertical axis A through the body 12 as a result of the front face 22 impacting a golf ball near the heel end 16 or the toe end 18 of the body 12. The sole 30 has a lower trailing edge 38 that includes an indentation 40 between the lower heel and toe weights 34, 36 as described in U.S. Patent No. 4,621,813 to Karsten Solheim. Located adjacent the lower trailing edge 38 of the sole 30 is a lower backsurface 42 of the perimeter weighting element 24. This lower backsurface 42 preferably slopes upwardly and inwardly from the trailing edge 38 toward the front face 22. The lower backsurface 42 merges with a lower innersurface 44 of the perimeter weighting element 24 along an upper trailing edge 46 of the sole 30. The indentation 40 and the sloping orientation of the lower backsurface 42 serve to redistribute material in the body 12 in a manner that increases the relative sizes of the lower heel and toe weights 34, 36 thereby increasing the resistance of the club head 10 to the above-mentioned twisting movement.

As seen in Figs. 4 and 6, a plurality of grooves 48, 50 are formed in the front face 22 of the body 12. The grooves 48, 50 are elongated in a heel-to-toe direction extending between the heel and toe ends 16, 18 of the body and include a set of eight grooves 48 of equal length and a set of six grooves 50 of varying length. A pair of shortened grooves 52 (approximately 1/8 inch long) are provided in the front face 22 aligned with

the groove that is designated 48a. These shortened grooves 52 serve as visual indicators and are preferably filled with a contrasting color of paint so that they are highly visible. One of the visual indicators 52 is disposed adjacent a heel end of the groove 48a, and the other visual indicator 52 is disposed adjacent a toe end of the groove 48a. When the club head 10 is placed at "address" behind a golf ball, the grooves or visual indicators 52 are utilized by a golfer in a manner to position the club head 10 so that the grooves 48 and 50 lie perpendicular (i.e. square) to an intended target line. If the visual indicators 52 are utilized in this manner, the club head 10 will not be inadvertently positioned with the front face 22 "open" or "closed".

It will be understood that the visual indicators 52 must be aligned with the opposite ends of the same groove 48 or 50 in order for the club head 10 to be properly positioned at "address". In club heads such as a wedge (not shown) where the front face 22 is disposed at a higher loft angle than in the club head 10, the visual indicators 52 are preferably aligned with a groove that is below the groove 48a in order to be more visible. In club heads such as a one-iron (not shown) where the front face 22 is disposed at a lower loft angle than in the club head 10, the visual indicators 52 are preferably aligned with a groove that is above the groove 48a so that they are more visible.

Although the visual indicators 52 have been described above in connection with iron-type club heads such as the club head 10, they may also be used on wood-type club heads such as that shown in U.S. Patent No. 5,294,037.

Referring to Fig. 11, the cavity 26 defined by the perimeter weighting element 24 has a bottom surface 54. Formed in the bottom surface 54 is an elliptically shaped geometric region 56, and formed integrally with and rising above the region 56 are a ring 58 and a projection 60. The ring 58 encircles the center of gravity of the club head 10 and the projection 60. Disposed in the cavity 26 is a plurality of five ribs 62, 64, 66, 68 and 70. Each of the ribs 62-70 extends generally radially relative to the cavity 26 from an inner end proximate the ring 58 to an outer end that merges with the perimeter weighting element 24. The rib 62 extends toward the toe end 18 of the body 12. The ribs 64 and 66 extend toward the top rail 28, and the ribs 68 and 70 extend toward the sole 30. As shown in Fig. 10, the ribs 62-70 each have an arch shaped cross-section.

If the front face 22 of the club head 10 impacts a golf ball at the center of gravity of the body 12 (i.e. at the projection 60), no undesirable vibrations are produced. However, if the front face 22 impacts a golf ball near the body heel end 16 or the body toe end 18, undesirable vibrations are eliminated by the ribs 62-70 and by the geometric region 56 and the ring 58. Other vibrations are attenuated by the ribs 62-70, the geometric region 56 and the ring 58. The ribs 62-70 account for about 85% of the total vibration elimination and attenuation while the geometric region 56 and the ring 58 account for about 15% of the vibration control. Vibration elimination refers to reduction of vibrations to a level that is not perceptible, and vibration attenuation refers to reduction of vibrations to a lower level that may still be perceptible.

Alternatively, the geometric region 56 may take the form of shapes other than an ellipse such as a diamond, a cloverleaf, a hexagon or a circle. Also, the ribs 62-70, 72-

78 and 80-94 may be connected to the perimeter weighting element 24 by mechanical means rather than being integrally formed with the perimeter weighting element 24.

CLAIMS

1. A golf club head comprising:
a body having a heel end, a toe end, a front face arranged for impact with a golf ball;
a plurality of grooves formed in said front face, said grooves being elongated in a direction extending between said heel and toe ends of said body; and
a pair of visual indicators disposed on said front face and aligned with one of said grooves for positioning the golf club head so that said grooves lie perpendicular to an intended target line, one of said visual indicators being disposed adjacent a heel end of said one groove, the other visual indicator being disposed adjacent a toe end of said one groove.
2. The golf club head of claim 1, wherein said visual indicators comprise a pair of shortened grooves formed in said front face.
3. The golf club head of claim 2, wherein said shortened grooves are filled with paint.
4. The golf club head of any one of claims 1 to 3, wherein said plurality of grooves includes a first set of grooves of equal length and a second set of grooves of varying length.

5. The golf club head of claim 4, wherein said one groove is in said first set of grooves.

6. A golf club head substantially as described herein with reference to the accompanying drawings.



Application No: GB 9619702.5
Claims searched: 1 to 6

Examiner: Alan Blunt
Date of search: 9 December 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): A6D (D23C)

Int CI (Ed.6): A63B 53/00, 53/04, 69/36

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB2215618A (CHORNE) - whole document	1
X	GB236875 (MacLENNAN) - whole document	1 to 6

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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